A Logical Journey

A logical journey: the anxiety of the Leśniewski quantifiers

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It must be permissible for a judge, faced with ambiguity
in a multi-lingual text, to refer to other versions.
To hold otherwise would deny equality to the different
languages of the Community, and increase the likelihood of
conflicting decisions in the national courts. 30 or more
conflicting decisions [on] various articles of this convention
already exist. (Sacks and Harlow (1977) 40 M.L.R. 578, 581-582

A. Of contexts: the Edinburgh School of Legal Theory

It is not easy to say succinctly what the Edinburgh school of legal theory, epitomised by the work of the late Neil MacCormick and Zenon Bańkowski, represents. It is not a specific theoretical position, nor is it a uniform commitment to a specific methodology such as 'ordinary language philosophy' or 'analytical jurisprudence.' From the outside at least, it may look like a rather eclectic mix of, amongst other things, formal and informal analysis of legal language, constitutional theory or catholic theology; a place where virtue ethics can meet legal formalism and discuss in a friendly way their differences. Its members are as likely to be inspired by catholic social doctrine as by Karl Marx, Adam Smith, Hannah Arendt, Niklas Luhmann or H.L.A. Hart. In seminars or in the common room, one could find oneself as likely discussing the implications of the *Factortame* decision as astrophysics, and Gödel's theorem was as often evoked as *Donoghue v Stevenson.* And yet, those who had the privilege to study or work with MacCormick and Bańkowski will nonetheless insist that there is a very specific flavour, a "thinking style", that weaves through all these different strands and combines them to something that is ultimately more than the mere sum of its parts, not a postmodern arbitrariness but rather a unity in diversity

that pays attention to the particular voice different schools of thoughts and thinkers within these school can contribute to our understanding of law, while maintaining the ability to link these back to the tradition of 'grand theorising' and universal accounts of what it means to live a life in the presence of laws and subject to them. This intellectual attempt to unify prima facie disparate traditions of thought finds its correspondence in their analysis of one important substantive part of their work, the analysis of the legal system of the European Union.

Connecting abstract, conceptual analysis in the tradition of Hart and Austin with specific, substantial issues of law and legal order is another distinguishing feature of the Edinburgh School. There too, they strived to develop a model that on the one hand preserves the various traditions of legal thinking in the European member states in their distinctiveness, and yet allows for a conceptualisation of the EU that goes beyond a mere fleeting alignment of interests of sovereign states. The resulting model thrives on the dynamic tension between the universal and the particular, a recurrent theme especially in Bańkowski's thinking, and permits to think of the EU as a unity that requires diversity, and is hence always and essentially conceptually contested. Of the two, McCormick developed the more explicit account of a theory of legal reasoning (see e.g. MacCormick 1978). Here, he developed a middle ground between the theories of Dworkin and Hart, looking in the process more closely at the logical form of legal arguments and their implication for our notion of justice than either of these two. *Resolving* a tension by providing a more abstract, meta-level of inquiry was very much a hallmark of MacCormick's method. What might appear as conflicting at first glance, when seen from the inside, is resolved as complementary rather than contradictory when seen from the outside. The same approach

we find in his political philosophy, where he develops a middle ground between an EU conceptualised as a new, monolithic nation state, and an EU that is merely a loose contractual connection between sovereign states (see in particular MacCormick 1993). The middle ground is a system of overlapping normative orders, which we move in and out of as we live our lives. These normative orders are not any longer hierarchically organised as in Kelsen's approach, and yet their peaceful co-existence is ultimately achieved through a set of rational meta-rules that tell us how to resolve conflicts between them. Part of the rationality of these rules in turn is their logical structure, and the universal constraints on rational practical reasoning MacCormick identified. For this purpose, classical logic is not just adequate, it reflects in its structure the normative concerns of MacCormick. Classical logic is unforgiving to contradictions. It is governed by the 'principle of Pseudo-Scotus' that states that from a contradiction, everything can be derived.[1] For the logical analysis of natural language, including legal reasoning, this means typically that the analyst has to resort to 'soft' meta rules of disambiguation that allow him to avoid any direct contradictions between sentences. 'Indexicalisation' is a typical method that can be employed, rendering e.g. the prima facie contradictory sentences: 'It is raining' and 'it is not raining' consistent by including indices for time and space ('It is raining at 3.00 pm in Edinburgh, but not at 4.00 pm in Berlin'). Commitment to classical logic therefore also means that it becomes a necessity that all conflicts can be ultimately resolved, the meta-rules of disambiguation that prepare the ground for a formal analysis mirroring in many

[1] Interest in the writing of the Pseudo-Scotus was of course revived by the Dominican polish theologian and logician Józef Maria Bocheński – who had been stationed during the war in Scotland. See e.g. (Mates 1965).

ways the meta-rules of statutory interpretation that resolve apparent contradictions between norms.

While we can see, therefore, a correspondence between MacCormick's choice of logic in his theory of legal argumentation, and his choice of political model in his theory of European integration, the situation for Bańkowski is much less clear. Bańkowski builds on MacCormick's notion of overlapping regulatory circles, but where in MacCormick, these are largely static, stable and ultimately (made to be) consistent, Bańkowski's model is much more precarious, constantly at the edge and what it has in terms of stability it gains through the permanent 'change-in-interaction' – just like Bańkowski-the-person, one could say it has to keep running to remain stable. In the process of engagement and when forming a relation, individual persons, and also legal systems change. Individual legal systems do not just contribute their concepts, histories and modes of problem solving to a patterned European identity. They change in the process by incorporating parts of the other states' identities into their own – and then change those of others in turn, in a constant process or rearrangement. Inconsistencies are in this model not a temporary bug that needs resolving, they are a feature that keeps the process going – it is this anxiety that forces me to constantly re-evaluate myself in the light of others, who in turn are changed by me, that gives the union its (always contested, always fragile) identity.

What logic is appropriate for legal reasoning in this type of precarious legal system? While Bańkowski wrote about issues of legal reasoning and legal logic - mainly in connection with the computer metaphor of legal formalism (Bańkowski and Schafer 2007) – unlike MacCormick he does not express a clear preference for any specific formal framework of logical analysis. The aim then of this paper is to identify a number of suitable

candidates for a logic that could be used as the underpinning for legal reasoning in the type of constantly evolving entity that Bańkowski describes. No definite answer will be given – instead, I will at the hand of a few examples discuss the general features such logic would have to have. As an illustration – and also for a sense of locale – I will use for illustration the case of *Buchanan v Babco*, a dispute that involves alcohol – Scottish whisky, to be precise, though in logical parlance, the result is isomorphic relative to the type of alcohol, and polish Vodka would serve just as well. It should be seen as another homage to those aspects of his thought that are influenced by the common law tradition and the '*mentalité*' of his country of upbringing, which remained throughout his life in a creative tension with those aspects that own more to the continental tradition of his country of birth and that of his ancestry respectively. I will show how the reasoning of the judges poses some challenges for logical analysis that are typical also for the type of legal order Bańkowski describes. Part of the answer will for obvious reasons involve Poland and the Polish tradition of logic. We will look at paraconsistent logics as a first step towards a formal analysis that is more accommodating to paradoxes, to represent the idea of (European Union) law as an essentially contested project. We will then look at various forms of formal descriptions of ontology evolution. Thirdly, we will look at a formal logic that owes much to the Polish logicians Leśniewski. Its two types of quantifiers allow us to represent shifts in perspective between an outside and an insider point of view. This will align to Bańkowski's notion of 'bringing the outside in.' Finally, we will step back and try to derive some general conclusions of the 'design requirements' for a legal logic in a dynamic multi-jurisdiction environment.

B. *Buchanan v Babco*

I will use in this paper one specific case, *James Buchanan & Co. Ltd. v. Babco Forwarding & Shipping (UK) Ltd.*,[2] to illustrate some of the pertinent ideas of Bańkowski's conceptualisation of supranational legal order. Starting with a particular case resonates with Bańkowski's emphasis on the role of the particular in legal reasoning (see e.g. Bańkowski 1998). It is not a case of European Union law, but the international law of carriage of goods – nonetheless, the lessons that we can learn from it apply just as much to legal reasoning within the European Union.

Babco Forwarding and shipping entered into a contract with James Buchanan and Co. for the carriage of 1,000 cases of whisky from Glasgow to Iran. They collected the whisky from a bonded warehouse in Glasgow, loaded it on to a trailer and sent it on its way from Glasgow to Felixstowe for shipment. On its way from Glasgow to that port it was taken to a lorry park in North Woolwich. There it was left for the week-end. When the lorry driver came to collect the whisky after the week-end, he found it had been stolen.

Whisky intended for export is exempt from excise duty, and therefore, no such duty had been paid on it. However, after it was stolen, James Buchanan became liable to pay excise duty to the amount of £30,000 on it - the presumption now being that the thieves would sell it in the UK. The relevant legislation is section 85 of the Customs and Excise Act 1952. It was stated explicitly in the contract of carriage that it should be subject to the terms and conditions stated in the 'Convention on the Contract for the International

[2] [1978] A.C. 141, 152

Carriage of Goods by Road.' Now, a potential ambiguity arises when the value of the goods is calculated. Article 23 of the Act, so far as material, reads as follows:

> **1.** When, under the provisions of this Convention, a carrier is liable for compensation in respect of total or partial loss of goods, such compensation shall be calculated by reference to the value of the goods at the place and time at which they were accepted for carriage.
>
> **2.** The value of the goods shall be fixed according to the commodity exchange price or, if there is no such price, according to the current market price or, if there is no commodity exchange price or current market price, by reference to the normal value of goods of the same kind and quality ...
>
> **4.** In addition, the carriage charges, customs duties and other charges incurred in respect of the carriage of the goods shall be refunded in full in case of total loss and in proportion to the loss sustained in case of partial loss, but no further damages shall be payable ...

But what was the value of the whisky at the place and time it was accepted for carriage, the warehouse in Glasgow? It is agreed that there was no commodity exchange price. Was there a current market price? If so, was it £37,000, including the taxes, or £7,000, excluding them?

What sets this case apart from a rather humdrum example of statutory interpretation in commercial law is the bilingual nature of the governing regulations, which as international treatise are published in authoritative versions in both English and French. Initially, Master Jacob, who assessed the damages, formed the opinion that the value of the whisky when it was taken out of the warehouse included the hypothetical excise duty that could have been levied on it. Any other construction would mean, he said, that there were two artificial values existing side by side, one with and one without excise duty. This is in itself an interesting (onto)logical argument that will have to be taken into account later.

Lord Denning, when the case reached the Court of Appeal, argued that the English version of the treaty was ambiguous and left a gap to be filled. In his opinion, looking at the French version was a legitimate way of resolving this ambiguity. In addition, he argued that not only was the French version of the text helpful for settling the ambiguity, he also argued that case law decided under the French version of the case was persuasive for doing so. However, French courts, and also the Dutch case that he cites,[3] have a somewhat different approach to legal interpretation. Denning is aware of this difference, and makes therefore the method of interpretation a part of his argument, citing Judge Kutscher's (1976) 'Methods of interpretation as seen by a judge at the Court of Justice, Luxembourg,' to show how the principles of construction differ from those applied in the UK, and why a continental approach is preferable.

In the subsequent, second appeal to the House of Lords, the lawyers for the pursuer argued that:

> If there be an ambiguity, even in a case such as this where the English and French texts are equally authoritative, the court can take advantage of the French text. There is no such ambiguity here, and therefore no need to have regard to the French text. We have no expert evidence in this case. Schoolboy French is all very well, but one is here dealing with very subtle shades of meaning. It is no great compliment to the official translators of texts to say that the English is not an accurate reflection of the French. It is not necessary here, to look at the French text. "Indemnite" is not necessarily used in French in the technical sense in which it is sometimes used in English, of an indemnity against all loss. Compare article 23, paragraph 4: "... but no further damages shall be payable." "Compensation" could be total, but could mean something less.

[3] *British American Tobacco Co.* (*Nederland*) *B.V. v. Van Swieten B.V.* (Amsterdam Court) (Unreported), Mar. 30, 1977

We face at least three possibilities:

> **1.** That there is a gap in the Convention which can be filled by judicial decision following a "continental method" of interpretation applied to the French version of the treatise (Lord Denning M.R.) As a subcategory, this may involve citing cases from foreign jurisdictions decided under that law.
>
> **2.** That the relevant words can be expanded in scope by looking at the French text of the Convention, but interpreting them using common law (UK) methodology (Roskill L.J. and Lawton L.J.).
>
> **3.** That the relevant words - in English - are, in the context of an international convention, wide enough to include the duty (Master Jacob)

Both the Appeal court decision and the House of Lords decision offer interesting arguments on two different levels: first, the discussion if at all, and if so how, the French text of the convention can be used to disambiguate the English text. Second, we find examples of the judges on an object level actually creating bilingual legal arguments. In the speech by Lord Salmon, we find for instance the statement:

> For my part, however, I consider that the French version "frais encourus à l'occasion du transport" is no more or less precise than the English version and therefore affords no real help in solving the question which confronts us.

Lawton L.J. argues that the word ‘compensation’ used in article 23, paragraph 1 had no exact meaning in English Law.[4] He considered that what he described as its ‘latent ambiguity’ was at once resolved by the French text, which made it plain, ‘...that the intention of article 23 is to provide an indemnity subject to limits,’ and he added:

[4] At 223

> Since the object of article 23 is to give an indemnity subject to limits, the principal limits being a financial ceiling and the exclusion of consequential damage, it seems to me that paragraph 4 of article 23 should be construed broadly.

He then examined the French text of paragraph 4, and concluded:

> The French phrase 'encourus à l'occasion' conveys the concept of 'arising from,' 'occasioned by' or 'resulting from.' The French text has convinced me that the words in the English version of paragraph 4 of article 23 should be construed as meaning 'any other expenses which the owner of the goods has to pay as a result of the carriage of the goods.' The payment by the plaintiffs of excise duty was just such an expense.

If we want to analyse formally the reasoning in this decision, we need to establish first a criterion for a successful formalisation. An adequate formal representation of the case should ideally show:

a) How the judges use foreign legal material to interpret the statute and;
b) The procedural arguments on how and when this is to be done.
c) Remain as true as possible to the syntactic surface structure of the arguments – in particular, we should be able to represent that the judges are citing directly words in French in their reasoning.

C. Paraconsistency and the European Union as essentially contested project

Using material from other jurisdictions to interpret statutes is an increasingly frequent occurrence in a global economy. Different legal systems have different rules governing the acceptability of such arguments. These rules in turn can become subject to legal argument about the applicability and interpretation, as in *Buchanan v Babco*.

Bańkowski's analysis of the emergence of a European legal order, using ideas from system theory (see e.g Schafer and Bańkowski 2003) are directly applicable to the scenario we find also in *Buchanan*. The objective of the analysis is to allow a way of thinking about legal systems such as the EU. It tries to avoid on the one hand to think of them in terms of simple 'superstates', federal entities that replicate the model of the US. On the other hand, it tries to give them more substance than mere coalitions between sovereign states that are temporarily bound to each other through contracts in international law. It should account for the continuous existence of local, national legal systems in their diversity, while at the same time allow for a process of convergence. The way to achieve this dual goal is to think of the process of European legal integration as a continuous process of becoming, something where conflicts and resolutions between legal systems is not a temporary phenomenon, a mere stepping stone to a classical, coherent legal system, but rather, it is an *essentially* contested project (Christodoulidis and Bankowski 1998), one that does not ultimately resolve incoherence between the different local legal systems, but exists in the process of achieving only temporarily stable alignments between states. In this process model of European legal integration, EU law provides the framework within which national legal systems 'change through exchange.' A constant process of borrowing or transplanting legal ideas from other EU jurisdiction, mediated by the European courts, is the driving force behind this process. However, the receiving system does not integrate the legal transplant in the exact same form that it has in its original context. Rather, they are 'creatively misunderstood' by the recipient system – echoing the insight form system theory that systems are cognitively open but normatively closed. '*Grenzstellen*', or border stations (Fögen and Teubner 2005), manage this process of transplantation – a typical

example being for instance a national court applying the transplantation rules of international private law. Alan Watson's comparative legal concept of 'legal transplant', the adaptation and integration of a foreign legal concept (Watson 1974), is in this approach recast and refined as a 'legal irritant' (Teubner 1998) – legal concepts from foreign law trigger so to speak an immune reaction in the receiving body, whose 'antibodies' ensure that the transplant is either rejected altogether, or suitably modified and insulated to 'fit' into the recipient system. Developing this biological analogy further, we can think of the European Court of Justice as an immunosuppressant – it decides on occasions if the modifications carried out by a national jurisdiction when implementing a directive (which is also a vehicle for transplanting foreign legal conception) went too far and changed the concept beyond recognition. Developing the medical metaphor, it is akin to taking a cell sample from a person, growing it in a recipient organism (which will change its genetic makeup) and then re-implanting it. A constant flux, a constantly 'inflamed' system that draws its dynamic from the need to incorporate persistently irritants, is the result. Crucially though, this is for Bańkowski not a mere stepping stone towards a more traditional legal system with its emphasis on systemic coherence. Nor is it simply a federated system where local laws may still be mutually inconsistent, but the borders between them are strictly defined, interaction is limited and we can always determine in principle which judicial sphere is relevant for us in any given point in time. Rather, it is the very process, the constant renegotiation of the local legal identities that then inform the collective identity, which is constitutive for the system. It is *essential*, rather than *instrumental* contestation. To the extent that Europe is heading towards 'closer and closer union', this 'union' is at the very least asymptotic, a constant move towards harmonisation without, in principle, the

possibility of ever reaching it. The reason is also that it is a moving goal – as states and their legal system change in the process of coming together and absorbing external influences, the meaning of what it is to have a union of *these* states constantly changes.

We can see the same process at work in *Buchannan v Babco*. Of the judges, Master Jacob is the most traditional. The vision of a legal system that models in reasoning is essentially Dworkinian – the path dependency of English law must not be derailed by external influences, the chain model can and should be continued using UK law alone. His system is both normatively and cognitively closed, no exchange takes place, but consistency is maintained. Denning and Roskill by contrast are cognitively open to the influence of foreign law. However, Roskill's approach stays normatively closed – the potential irritant is to be interpreted using common law methodology only and thus made compatible with the receiving body of law. That the import may change in the process substantially its originally intended meaning is not just inevitable, it is desirable. Denning's approach by contrast remains also normatively open – to a degree at least, as he too interprets the law inevitably from the '*mentalité*' of a UK trained lawyer. Let us now hypothetically continue the story. Assume that a French court litigates a similar issue, and in doing so develops French law further by looking at the UK courts' interpretation of the English text. At least in Denning's case this would be influenced by his attempt to interpret it in the light of what he thinks a French approach to the French version would have been. We can easily see how French law now might change through an irritant that originally started its journey within the French legal system, not outside of if.

One should also note that this process is self-reflective in a crucial way. It is not simply the case that in *Buchanan v Babco*, a small piece of French substantive law was

introduced into UK jurisprudence. Rather, by giving reasons for their decision and deliberating explicitly on the method of interpretation that should be used, the case also changes the criteria of what counts as a valid legal argument in UK law. Meta-level reasoning and subject level reasoning are crucially intertwined, and it is this connection that shows why it is not hyperbole to say that in cases such like this, the very nature of a legal system, its self-understanding, has been changed through an irritant.

Developing a formal account of this type of process is for many reasons a considerable challenge. The most important one I alluded to already in the introduction, Classical logic is unforgiving towards inconsistencies. The reason for this is known as the principle of explosion – from an inconsistent set of premises, every conclusion can be reached. This is the ultimate justification behind Master Jacobs' argument that it is simply not acceptable to have two contradictory prices of the same product at the same time. We can informally understand how the principle works by looking again at our case. Due to the disagreement between the judges, we have, at least temporarily, the following two sentences as part of our legal system: 'Babco owes £37000 and not £7000' and 'Babco owes £7000 and not £37000.' Let us now chose an arbitrary sentence, say "Britain is a republic". (It does not matter if the sentence is factually true or false, any sentence will do).

Let us begin with '*Babco owes £37000 and not £7000*' as one of our two premises. From this, we can infer through disjunction introduction that also '*Babco owes £37000 and not £7000*' **or** 'Britain is a republic' must be true. The reason for this is that a disjunction is a weaker statement than asserting each component individually: if I already know that A is true, I also know that the weaker 'A or B' must be true. This is of course the magicians trick, for now, we can infer: If 'Babco owes £37000 and not £7000' or 'Britain is a

republic' is true, and we also know (again, as a premise) that 'Babco owes £7000 and not £37000', then it must be the case that 'Britain is a republic' is true. This is the straightforward application of the disjunctive syllogism: if I know that 'A or B' is true, and I also can show that A is false, then B must be true. Obviously, we can now prove also that Britain is not a republic, using the exact same inference, and indeed every sentence we wish – even the proposition: 'Zenon Bańkowski is a happy go lucky hedonist with no worries in the world', which would defy the very theme of this book and through a Gödelian paradox of self-reflexicity cause harm to the autopoetic system that is the reader – as Zenon precisely did *not* argue in Bańkowski (1994).

Since this is obviously unacceptable, classical logic had to find ways to deal with the ubiquitous inconsistencies found in most legal systems. One family of logics has been developed with the specific aim to prevent logical explosion, and is therefore a good first candidate for a logic that could underpin legal reasoning in the type of multi-layered system Bańkowski had envisaged. Paraconsistency, a term coined by Miró Quesada in (Quesada 1976), enables a more discriminating approach to inconsistencies. There are by now quite a number of competing formalisms that try to achieve the same aim, details of which can be found in (Brown 2002) or (Priest 2002). I will only give here a first impression of the field, and focus on some aspects that are form a philosophical perspective particularly pertinent. While the term 'paraconsistency' comes from the 1970s, when the interest in theories with this feature boomed, formal logics that we would call today 'paraconsistent' are older. The first formal account of a system that blocks logical explosion was developed by (of course) a Polish logician, Stanisław Jaśkowski, in 1948 (Perzanowski 1999). His main idea was the logic of discourse: in a debate, a participant proposes positions or beliefs that (if honest) are

true according to the participant. They will, as a bare minimum, be self-consistent, yet will often be inconsistent with those of the opponent. To model the discourse from the sum of its constituent parts, Jaśkowski formalised this in the form of a discursive logic, with a possible world semantics. If I assert a sentence *A* in a discourse, then from the perspective of the discourse, this is interpreted as the much weaker 'it is possible that *A*' ($\Diamond A$). This allows for the translation of sentences of the new discussive logic into the language of model logic, typically *S5*. *A* then holds in a discourse already if *A* is true in some possible world of the set of all possible worlds *M* over which S5 is interpreted. And since *A* may hold in one world but be false in another, both *A* and $\neg A$ may hold in one and the same discourse.

There is something intuitively appealing about this approach in legal contexts. Legal adjudication is a dialogical process. Not only that , when it comes to high level, precedent setting adjudication in appeal cases, it is almost inevitably the case that both sides will be able to make good arguments for their respective sides – if one side were obviously untenable, the case would have been terminated long ago. If then the very best judges disagree amongst themselves in their respective speeches too, it seems inevitable to conclude that the various interpretations are at very least all possible, though eventually one may turn out to be more plausible than the others. So while 'from the inside', every partie's monologue argues that their interpretation *A* is *true*, from the outside, the perspective of the dialogue, what they really argue is just that their interpretation is *possible* – and they may even realise that this holds true for the other side as well, though they would not admit to that explicitly. It is precisely this transition from the inside perspective of the discussants

to the outside perspective of the dialogue, or legal system, that Jaśkowski's logic is based on.

The idea that 'worldviews' or belief systems will typically be internally coherent, but mutually inconsistent, so that every formal representation that models talking about several such systems needs to be able to handle inconsistencies, has been developed for instance by Batens (1998). However, this also shows the limitations of a paraconsistent analysis, both formally and from a philosophical perspective. While it allows us on the object level of the formal language to tolerate inconsistencies and to represent them, on the meta-level, they disappear and become indices to possible worlds. So while we can represent the statements 'Babco owes £37000 and not £7000' and 'Babco owes £7000 and not £37000', their meaning, seen from a meta-language perspective, simply becomes 'there is a world where Babco owes £37000 and a different world where he owes only £7000.'

There are possible worlds (possible legal systems) where Babco owes £37000 and not £7000, and then there are other) possible worlds were the inverse is true. The contradiction disappears. But of course, we could have achieved the same in the object language and stayed within the formal framework of classical logic, by talking explicitly about jurisdictions or interpretations. The statements: 'Interpreted within the French system, Babco owes £37000 and not £7000' and 'Interpreted within the common law system, Babco owes £7000 and not £37000' are of course consistent. This, one could argue, is similar to another observation Bańkowski made about modal deontic logics in general (e.g. Bańkowski and Schafer 2007): they ultimately destroy the idea of normativity by translating it into descriptive terms, i.e. the deontically demanded becomes what is actually the case in some possible world. Here, the normative tension is destroyed by separating the

contradicting propositions and assigning them separate worlds. They now exists peacefully side by side, but are precisely not any longer 'essentially contested' – the contest disappeared in the analysis. So we may need something more, something that represents the dynamic aspect of the creation of order through the contest of conflicting ideas.

D. Ontology Repair and Europe as 'Journey'

In 'The Journey of the European Ideal' (Bańkowski 2009) the idea of the process character of a constant becoming and reshaping of legal order in Europe was made explicit. I have given above a short account of the underlying process by which the contractual framework of the EU provides a setting where normative system can exchange component parts. It may therefore be a good starting point to give a formal account of these component parts (e.g. the concept of contract), and with that , look at the development of a formal ontology rather than take a theory of legal reasoning as starting point. The standard definition of an ontology for computer science was given by Tom

Gruber (1993) as 'An explicit specification of a conceptualisation', where a conceptualisation is 'an abstract simplified view of the world that we want to represent for some purpose.' For lawyers, especially continental lawyers, the 'ontology' of a law is what is described in the general part of a code – the part where the domain of the law is specified, what it is 'about.' So we could translate the role of the general part of a Code as saying that 'private law is about persons, things and objects (top level categories), the first is divided into natural and judicial persons (specification of the top level concepts)…' These component parts, legal concepts, act as an irritant in the recipient system, which then has to transform both itself and the irritant to reach a brief moment of stability – only to export this newly achieved concept to it originators. Eventually it receives the recycled

version back, when the cycle repeats itself. Similar processes are tackled by system engineers in artificial intelligence research. A computer system may receive an input that is inconsistent with its knowledge base. Rather than having a logical explosion, the system tries to repair itself, making the necessary modifications autonomously. For this, it needs to reason also about the very process of repairing itself, making notions such as 'context' explicit. It would require a formal ontology representation of the two putative objects, the French and the English 'market price' (one with taxes as a necessary part, the other without), valid in their respective contexts, and then formalize the meta-reasoning that compares, matches and ultimately combines (repairs) the two.

Context logics (Serafini and Giunchiglia 2002) are one such approach that has very similar aims. The term 'Multi-Context Logics' (MC Logics) refers to a family of logics for the representation of contextual reasoning based on the two following principles:

* Principle of Locality

Reasoning uses only part of what is potentially available – as an English lawyer, I will not normally use French precedents to argue my case, even though I know that there is such a thing as 'the French legal system' and that I can, if needed, draw on this resource. The part that is used while reasoning is called the context (of an argument). Note that while similar to a possible world, the notion s much more fluid and task specific.

* Principle of Compatibility

There is compatibility among the reasoning performed in different contexts.

This principle I mention just so that I can (partly) violate it. One of the potential problems of the paraconsistent approach outlined above is that it preserves the inconsistencies but prevents conflict between them. This could be seen as an almost postmodern 'anything

goes' especially in those forms of paraconsistent logic such as Graham Priest's 'dialetheism' where sentences can indeed be true and false at the same time (Priest 1998). I noted above the method pluralism that is characteristic of the Edinburgh school. It would however be a mistake to identify this eclecticism with arbitrariness. Openness to ways of thinking was always tempered by the tradition of the Scottish enlightenment and its firm commitment to rational discourse. This also involves a 'reality principle' – there is just one reality of which we can get a better and better understanding. Without a commitment to a destination, even if it is only an aspiration or 'regulatory ideal' the very concept of journey becomes meaningless. Although we can realize through a meta induction that the process will never end and that the journey ultimately is the goal, this can only be the result of an inductive inference, and not our starting point. Only if we have an incentive to go beyond the inconsistencies are they able to play their transformative role and push us forward.

In Multi-context logics therefore, we have as a fundamental assumption that repair is possible, that at least temporarily, consistency and stability can be achieved. To do this, these logics view context as a set of interacting formal theories, each with its own language, semantics and axiomatic system. Relations between contexts are represented as interaction between theories. The fact that these theories have their own language makes them particularly suitable for issues such as *Buchanan v Babco* – something traditional logic that takes place in the 'heaven of propositions', independent of any specific natural language, can't replicate. In a classical logical approach to modeling, the logician would rely on the legal expert to give 'the' logical structure of the relevant piece of international law – this has to precede any attempt to model the reasoning by the court. From a classical logic point of view, if does not even make sense to speak of the French and the English representation

of this law, the very issue that is at the heart of the legal debate would have to be resolved already in the process of translating the natural language into code. By contrast, multi context logics can talk about 'the Act in its French law context' and 'the Act in its English law context', where a bridge rule between the contexts ensures that we speak about the same Act, but an Act with different logical form in each context.

The notion of context as an individual's partial and approximate theory of the world plays an essential role here. The crucial shift from modal logic to contextual logic is that the first encodes an 'objective' perspective on problems – based upon the concept of possible world – whereas the second encodes a 'subjective' perspective – based upon the concept of context. John McCarthy (1993) advocated the use of context to cope with exceptional cases to general rules. We can create rules that apply in general contexts, and overrule them in specific contexts – something that 'fits' Bańkowski's emphasis on the dialectic between the universal and the particular. The basis of McCarthy's contextual logic is a *ist(c; p)* predicate, which asserts that proposition p *is true in* context c; and linking axioms, which assert a relationship between *ist* predicates for different contexts.

McCarthy further developed the idea by introducing an "outer context": All propositions are asserted with respect to a context, with the outer context as the containing context for all contextual assertions – a first step maybe for an analysis of Bańkowski's notion of 'bringing the outside in' as yet another way to describe the process of changing oneself (or one's legal system) through a 'gestalt switch' between inside and outside contexts.

The Giunchiglia (or 'Trento') model of context is based upon the idea of a multi-context (MC) system. These systems are based upon similar intuitions to the McCarthy model of context, but rather than introducing a *ist* predicate MC systems have context as

part of the meta-logic and introduce ‘bridge rules’ to enable inter-context reasoning. This difference also means that contexts and bridge rules are not object language objects in a MC system, so we can’t reason about them explicitly. This is the reason why I will later combine this approach with McCarthy’s. A context consists of a logical language (e.g. first order logic), a set of axioms in this language (e.g. the rules of English law) and a set of inference rules. The notation c: F is used to express that formula F is true in context c. Reasoning between contexts is done using bridge rules, rules whose premises and conclusion belong to different contexts.

In the examples of contextual propositions I give I use the Trento notation c : p to indicate that proposition p is true in context c. However I use the McCarthy approach to contexts, so that contexts can be treated as first-class objects within the logic, crucial to make explicit the reasoning of the judges The notation c: p should be considered shorthand for the assertion *ist*(c; p).

A legal-system context would define the rules that govern the reasoning and procedures within a given legal system. These rules place constraints upon how lawyers can behave in a legal case, within that legal system.

For example there might be the following rule in the English Legal System:

> English law: For all X;Y: similar(X;Y) & There is a V;V’:verdict(X;V) & verdict(Y;V’) -> V =V’

which states that in the context of English law, if two cases are similar then their verdicts should be the same.

This rule (partially) expresses the principle of binding precedent in English law, and can have for a formal analysis a twofold purpose: it is an element of the context within

which the decision takes place, and at the same can form part of the argument the parties are making – 'we are in the context of English law, and hence interpretation X should hold' vs. 'We are in the context of English law, and should change this context so that Y holds.' Self-reflexivity is one driver behind the ability of a system to repair itself, and to grow through the import of new elements which can also be 'context changing.'

E. Bringing the Outside in: Leśniewski Quantifiers

We have seen above two crucial requirements for any suitable formalism to represent legal reasoning in the type of legal system Bańkowski envisaged. It requires an ability to represent multiple contexts, but not contexts that remain in splendid isolation, but interact with each other and share component parts. For this, we also need the ability to reason explicitly about contexts – the one we find ourselves in, and the one we perceive from the outside. Where the formalism allows for different languages for different contexts, reasoning in multi-language contexts such as the EU becomes possible. In the Multi context logics that we have seen above, one and the same statement can then be interpreted differently, depending on whether an 'outside' or 'inside' perspective is taken. Change happens in the system in particular if we 'bring the outside in', a key concept in Bańkowski's jurisprudence.

The disadvantage of these approaches, however, is that they stray far away from the syntactic surface structure of the legal arguments. Once we have translated Denning's speech into a formal representation using the language of MCL, it is not any longer an easy task to reconstruct the original natural language version. In radically changing the syntactic structure of the original in this way, these approaches betray their origin in automated theorem proving and computer science. They are needed if we want to leave the reasoning

process to a machine, but they are less suitable for a formal analysis of legal reasoning that tries to gain jurisprudential insights from the process.

Inside-outside ambiguities are studied in philosophical logic in particular in the formal analysis of belief statements and other 'intensional' contexts: Ponce de León searched for the fountain of youth. The fountain of youth does not exist. Does this mean Ponce de Leon searched for something that does not exist? That answer depends on what perspective we take. From the perspective (the context) of an outside observer, the statement is certainly true, and the substitution legitimate. From the inside perspective, it is more problematic. Had we asked Leon: 'Are you searching for something that does not exist?', his answer would have been a clear 'no, of course not, that would be silly.' Here, the substitution should fail.

In law, this issue frequently arises in the context of criminal intent. Assume Peter met Paul a long time ago during a holiday trip. Paul starts an affair with Peter's wife. Peter, enraged, vows to kill Paul and follows him to his country for the deed. Unknown to him, Paul is the president of this country. If Peter now attempts to kill Paul, we may not be entitled to replace 'Paul' by 'the serving president', at least not if we want to give a true account of Peter's beliefs from the inside perspective. The legal implications are obvious: depending on the legitimacy of the substitution, we may be able to charge Peter for both attempted murder and terrorism offences, or only for attempted murder. He intended to kill Paul, but he did not intend to kill the president (in one reading), which may be the required *mens rea* for a charge under laws that protect the president *ex officio*. Modal terms such as 'believes that', 'intends to' or 'promises to' introduce referential opacity into language, and mere co-extensionality is not enough to guarantee that the truth value of a statement

remains the same after substitution of co-referential terms. Since the 1950s and the work by Saul Kripke and Jaako Hintikka, intensional contexts like this are normally analysed within the framework of a possible worlds semantics (see e.g. Kripke 1965; Hintikka 1965) From Kripke (1979), we also get an influential bi-lingual example, which gets us even closer to the issue in *Buchanan v Babco*: Imagine a French citizen, Pierre. Pierre, proudly French and monolingual, believes on the basis of some films he saw the following: 'Londres est joli' ('London is beautiful'). Much later, Pierre moves to London without realizing that London = Londres. In England, he immerses himself in British culture and learns English the way a native speaker would learn it, without translating from French. Pierre lives at this time in a very unattractive part of London, which he now associates with the word 'London', so he comes to believe that London is not beautiful. According to Kripke, Pierre now believes both a) that 'Londres est joli' and b) that London is not beautiful. But what does he believe of London, is it pretty or ugly? One natural way to render this into a language philosophers find helpful is to say that Pierre believes *of London* (*de re*, the actual object) under the description (*de dicto*) 'London' that is it ugly, and he believes of London under the description 'Londres' that it is beautiful. In this case, we use the quotation mark to preserve the exact form of his belief expressed in the foreign language. We have seen above that this tool is also used by the judges in *Buchanan*, In Lawton's speech, we find e.g.: The French phrase 'encourus à l'occasion' conveys the concept of 'arising from', 'occasioned by' or 'resulting from.' If we want to preserve this type of reasoning, we need to enrich our logical language with a quotation function "" that takes states of affairs X as their argument, and turns them into language specific linguistic objects. This allows us to represent the same legal rule in different linguistic contexts. This alone is sufficient to

prevent logical explosion, as the resulting objects are not any longer sentences that can be true or false, and hence contradict each other, but, ontologically speaking, objects (think of the actual ink molecules that make up a written word, the sign, and ignore everything it signifies, its meaning). In this sense, "Babco must pay £37000" and "Babco need not pay £37000" don't contradict each other any more than "House" and "Fish" do. They are all objects we can talk *about* – '"Babco must pay £37000" is a sentence with five words' is for instance a true sentence, as is '"Fish" has four letters' – but as objects, "Babco must pay £37000" or "Fish", they are not of the right category to be true or false.

However, with this solution we would again lose too much – we insulate ourselves from contradictions, but can't any longer "see" the underlying relation between these objects that interested us in the first place. Therefore, we need to find a way to "talk about" or "quantify over" the objects *within* the brackets. We want to say things like this:

> Causation de-re, as actual object under the French legal description '"*encourus à* l'occasion' conveys the idea of *"arising from"'*

That is we want to establish that two expressions in different languages can, after all, be about the same objects. The technical solution for this was developed by two other Polish logicians, Stanisław Leśniewski (1929) and Kazimierz Ajdukiewicz (1934).

Leśniewski's determined nominalism resulted in a rejection of the referential interpretation of quantifiers. While *words* such as 'whisky' undoubtedly exist, we should not, in our logical analysis, commit ourselves to the existence of anything more than that, and in particular not a ('de-re#) entity out there in the world, whisky, named by the term 'Whisky.' Ajdukiewicz saw the potential of this approach for the analysis of intensional contexts and refined Leśniewski's ontology to take the distinction between real and

intentional objects into account (Dolling 1995). The solution here follows the spirit, if not the technical detail, of his analysis. A full technical exposition can be found in Schafer (1998), based on an earlier idea by Blau. In this approach, alethic, deontic and epistemic expressions are interpreted as predicates, not as operators. Modal predicates take a special kind of structured objects, sentences, as their arguments. Each predicate carries a type _ = "•" or "◦", indicating whether its argument position is interpreted referentially, about the world (•) or substitutionally (◦), about the linguistic expressions. Intuitively, we could say that a Lesnieswki quantifier 'grasp' an expression or word from the big bag that is our universe, a classical quantifier grasp an object named by a word and substitutes it where the variable is.

Correspondingly, I distinguish *de re* and *de dicto* variables x• and x◦. *De dicto* variables correspond closer to Leśniewski's uniform variables. Consequently, a sentence of the form $\exists x \circ P \circ x \circ$ is true if a name can be found which, when substituted for the bound variable yields a true sentence. The predicate *P* could stand for instance for the property of being mystical. If the name 'Santa Claus' is in our universe of discourse, the sentence is true.

The working of this formalism is best understood if we look at some examples. In our example above, we had the situation that a person, Peter, wants to kill another person, Paul, whom he suspects to be a rival. He kills Paul with a knife. Since it is only possible to kill existing people, and if Paul was (also) the president, he therefore also killed the president. This fact is therefore formalised with de re predicates, as

(1) $M^{\bullet\bullet}(a, b)$.

Here, the de re types guarantee that both argument positions are interpreted referentially, they refer to the same object, however you describe it.

Peter however also formed beliefs about the situation, he believes certain sentences to be true. As indicated above, sentences are treated as complex objects that can occur at de dicto argument positions. Unsurprisingly, the belief predicate has in its second position a de dicto-type.

$B^{\bullet\circ}$ (a,"$M^{\bullet\bullet}$(2) (a, b)")

with B – believes; M – murders; a – Peter; b – Paul.

This expresses the idea that Peter believes 'I murdered Paul' – but since 'Paul' is within the scope of a quotation mark, it is now not any longer possible to substitute 'Paul' with 'the president.'

However, we can also 'bring the outside in' and express, from the outside perspective, the idea that Peter believes of Paul, under the (inside perspective) description 'Paul', that the killed him, and under the description 'the president', that he did not kill him.

$\exists x^{\circ}\, y^{\circ}$ (x° = b & y° = c $B^{\bullet\circ}$"(a,$M^{\bullet\bullet}$(a, x°)" & - $B^{\bullet\circ}$"(a,$M^{\bullet\bullet}$(a, y°)"))

With b = Paul and c = the president

The very same structure allows us to preserve the syntactic structure of the relevant bilingual arguments made by the judges. Lord Denning e.g. argues that the market- price-de re, under the description '*encourus à l'occasion'* has the property of being £37000, but under the description 'resulting price' only the value of £7000. The logical structure is the same, c now is 'resulting price', b is '*encourus à l'occasion.'*

F. Conclusion

Both MacCormick and Bańkowski thought of the European Union as an entity different from both a traditional nation state and a mere contractual arrangement that coordinates the efforts between such states but leaves their identities unchanged. The resulting model is one of multiple, mutually inconsistent spheres of regulation that nonetheless coexist. However, MacCormick's approach remains ultimately beholden to Kelsen, the tensions are acknowledged, but isolated and rendered harmless through meta-rules that tell us in which context we are for any given situation. This is particularly true for his later work such as MacCormick (1999) where the more radical pluralism of his earlier writing that we find in 'Beyond the Nation State' finds its resolution in 'pluralism under international law.' For the type of legal system that emerges from such a model, classical logic remains appropriate to model legal reasoning within the system. By contrast, Bańkowski's approach is more radical, dynamic but also precarious. It gains whatever temporal stability it has only by being constantly in flux, like a spinning top that requires constant momentum. Anxiety, in this sense, does indeed become a creative force – the constant need to redefine oneself in the face of the "irritants" that one incorporates from the outside. To model reasoning in this type of system, logical tools different from classical logic are needed, tools that are capable of not just handling contradiction, but allowing contradictions and tensions to challenge us and thus become creative forces. I very briefly discussed three different families of approaches that can provide such a logic, or at least explicate aspects of Bańkowski's theorizing. Two of them were heavily influenced by the Polish school of logic, and the second of these I developed while working in Bańkowski's Edinburgh. It is not claimed that any one of them can give a full account of the richness of his thought. Nor is it fruitful to decide which one of them is better suited for the task. Rather, they should be seen as a

first approach to a contribution to a 'universal logic' in the sense Jean-Yves Béziau (2007) uses this term, as a study that tries to give an account of what features will be common to all suitable logical structures that could express a certain conception of legal reasoning and legal system. While the term 'universal logic' is recent, it too has its roots in the Polish logical tradition, in particular the works of Alfred Tarski. The account remains deliberately sketchy. It is, as always, a journey. I was truly privileged to travel a short while together with Zenon on it.

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